

AMENDMENTS TO THE CLAIMS

The following is a complete, marked-up listing of revised claims with a status identifier in parenthesis, underlined text indicating insertions, and strike through and/or double-bracketed text indicating deletions.

LISTING OF CLAIMS

1. (CURRENTLY AMENDED) A method ~~for selecting pulse lengths~~ for measuring at least one of a concentration and change in concentration of a redox-active substance as a mediator in a molecular-biological detection system, in which as a result of application of suitable potentials to a working electrode, at least one of a reduction process and an oxidation process takes place as a redox reaction, the method comprising:

measuring an oxidation current to obtain a measuring phase;
measuring a reduction current to obtain a relaxation phase;
pulsing the potential of the working electrode, and alternately forming the measuring phases and the relaxation phases;
selecting measuring-phase pulse lengths so that, at the end of the pulse, a capacitive current is small in comparison with a Faraday current; and
selecting relaxation-phase pulse lengths so that, at the end of the pulse, a concentration gradient is relaxed such that at a beginning of a following measuring phase, the change in concentration of the mediator, brought about by the measurement of the mediator, is reversible.

2. (PREVIOUSLY PRESENTED) The method according to claim 1, wherein a current, measurable at the end of the measuring phase, forms the measuring signal.

3. (PREVIOUSLY PRESENTED) The method according to claim 1, wherein, when measuring oxidation currents, a reduction potential is set during the relaxation phase and the species oxidized during the measuring phase and still located in front of the working electrode are reduced again.
4. (PREVIOUSLY PRESENTED) The method according to claim 1, wherein, when measuring reduction currents, an oxidation potential is set during the relaxation phase and the species reduced during the measuring phase and still located in front of the working electrode are oxidized again.
5. (PREVIOUSLY PRESENTED) The method according to claim 3, wherein the repetition rate for the pulsed redox-cycling amounts to at least 1/10 Hz.
6. (PREVIOUSLY PRESENTED) The method according to claim 3, wherein the pulsed redox-cycling is carried out with predetermined pulse shapes.
7. (PREVIOUSLY PRESENTED) The method according to claim 1, wherein the relaxation phase is at least as long as the measuring phase.
8. (PREVIOUSLY PRESENTED) The method according to claim 7, wherein the relaxation phase is longer than the measuring phase.

9. (PREVIOUSLY PRESENTED) The method according to claim 8, wherein, with a repetition rate of 1 Hz, the pulse lengths of the measuring phases amount to 100 to 300 ms, and the relaxation phase amounts to between 700 and 900 ms.

10. (PREVIOUSLY PRESENTED) The method according to claim 1, wherein the potentials are selected so that the reactions occur in a diffusion limiting current range.

11. (WITHDRAWN) Device for carrying out the measuring method according to claim 1, comprising:

a facility for producing potentials that are determinable with respect to time and are variable electrically; and
a transducer array.

12. (WITHDRAWN) Device according to claim 11, wherein the transducer array comprises at least one flexible planar metal substrate, arranged on which there is at least one flexible insulator with a fixed connection between the metal surface and insulator surface, with the metal substrate being structured in such a way that metal regions exist that are electrically insulated from each other, and with the insulator that is located on the metal substrate being structured in such a way that cavities with open metal surfaces are defined in the insulator, with the metal regions being contactable from the side that is remote from or lies opposite the sensor area.

13. (WITHDRAWN) Device according to claim 11, wherein the transducer array comprises areal electrodes, whose smallest extent is relatively greater than typical diffusion lengths.
14. (WITHDRAWN) Device according to claim 13, wherein the areal electrodes have an extent of at least 30 μm .
15. (WITHDRAWN) Device according to claim 14, wherein the areal electrodes are formed using thin-film technology on a non-conductive, rigid substrate.
16. (WITHDRAWN) Device according to claim 15, wherein the rigid substrate is silicon.
17. (WITHDRAWN) Device according to claim 16, wherein an insulator is provided on the substrate.
18. (WITHDRAWN) Device according to claim 11, wherein the facility for producing predeterminable electric potentials is a potentiostat.
19. (WITHDRAWN) Device according to claim 18, wherein associated with the potentiostat for producing pulsed electric potentials there is a pulse generator.
20. (WITHDRAWN) Device according to claim 19, wherein operational amplifiers and a defined measuring resistor are provided in the potentiostat.

21. (PREVIOUSLY PRESENTED) The method according to claim 3, wherein the repetition rate for the pulsed redox-cycling amounts to at least 1/10 Hz.
22. (PREVIOUSLY PRESENTED) The method according to claim 6, wherein the pulsed redox-cycling is carried out with at least one of a rectangular, triangular and sinusoidal course.
23. (PREVIOUSLY PRESENTED) The method according to claim 4, wherein the pulsed redox-cycling is carried out with predetermined pulse shapes.
24. (PREVIOUSLY PRESENTED) The method according to claim 23, wherein the pulsed redox-cycling is carried out with at least one of a rectangular, triangular and sinusoidal course.
25. (PREVIOUSLY PRESENTED) The method according to claim 8, wherein, with a repetition rate of 1 Hz, the pulse lengths of the measuring phases amount to 250 ms, and the relaxation phase amounts to 750 ms.
26. (CURRENTLY AMENDED) A device for selecting pulse lengths for measuring at least one of a concentration and change in concentration of a redox-active substance as a mediator in a molecular-biological detection system, in which as a result of application of suitable potentials to a working electrode, at least one of a reduction

process and an oxidation process takes place as a redox reaction, the device comprising:

 a device for measuring an oxidation current to obtain a measuring phase;

 a device for measuring a reduction current to obtain a relaxation phase

 a device for pulsing the potential of the working electrode, to alternately form the measuring phases and the relaxation phases;

 a device for selecting, in this connection, the measuring-phase pulse lengths so that, at the end of the pulse, a capacitive current is small in comparison with a Faraday current; and

 a device for selecting the relaxation-phase pulse lengths so that, at the end of the pulse, the concentration gradient is relaxed so that at the beginning of a following measuring phase, the change in concentration of the mediator, brought about by the consumption of the mediator by the measurement itself, is reversible.

27. (PREVIOUSLY PRESENTED) The device according to claim 26, further comprising:

 a device for measuring at least one of a concentration and change in concentration of a redox-active substance as a mediator, in a molecular-biological detection system, using the selected pulse lengths.

28. (PREVIOUSLY PRESENTED) The method according to claim 1, further comprising:

 measuring at least one of a concentration and change in concentration of a redox-active substance as a mediator, in a molecular-biological detection system, using the selected pulse lengths.